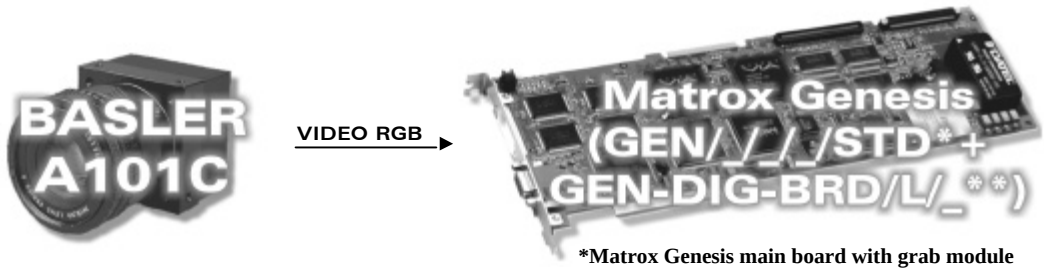
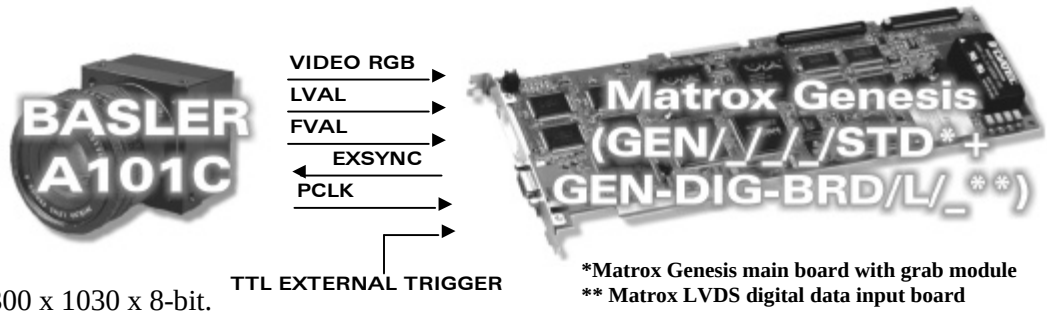
Application Note:
Interfacing non-standard cameras to Matrox Genesis

MATROX GENESIS

BASLER-MVC A101C

February 29, 2000

Camera Descriptions	• 1300 x 1030 x 8-bit @ 12 fps. • Single channel LVDS digital video output. • Color image generated through software-based conversion. • Progressive scan. • External sync. • Internal exposure control. • Pixel clock: 18 MHz
Interface modes	• Pseudo-continuous, asynchronous reset (binning, non-binning)
Camera Interface Briefs	**Mode 1: Pseudo-continuous**  ***Matrox Genesis main board with grab module** ****** Matrox LVDS digital data input board** • 1300 x 1030 x 8-bit @ 10 fps. • Single channel LVDS digital video. • Progressive scan. • Matrox Genesis receiving video signals from camera. • DCF used: A113CC.DCF (non-binning) • DCF used: A113BCC.DCF (binning) **Mode 2: Asynchronous Reset**  ***Matrox Genesis main board with grab module** ****** Matrox LVDS digital data input board** • 1300 x 1030 x 8-bit. • Single channel LVDS digital video. • Progressive scan. • Matrox Genesis receiving external trigger. • Matrox Genesis sending EXPOSURE1 (EXSYNC) signal to camera. • Matrox Genesis receiving HSYNC (LVAL), VSYNC (FVAL), PIXEL CLOCK (PCLK), and video signals from camera. • DCF used: A113CAR.DCF (non-binning) • DCF used: A113CBAR.DCF (binning)

Camera Interface Details

Modes 1: Pseudo-continuous

- **Frame rate:** Matrox Genesis receives the pseudo-continuous video from the camera at a frame rate equal to 10 frames per second.
- **Exposure time:** Exposure time is inversely proportionate to the frame rate (no shutter) or determined by the shutter setting. Refer to the camera manual for more information.

Mode 2: Asynchronous Reset (Pulse Width Control Mode)

- Once it has received the external trigger signal, Matrox Genesis sends the EXPOSURE1 (EXSYNC) signal to the camera with a width equal to the desired exposure.
- **Frame rate**: The frame rate is determined by the frequency of the external trigger signal.
- **Exposure time:** The active and inactive periods of the EXPOSURE1 (EXSYNC) signal is the exposure time. The default exposure time for this DCF is equal to **3.82 ms**. In order to change the width and deployment time of the EXPOSURE1 (EXSYNC) use the Exposure Settings menu tab in Matrox Intellicam. Consult the Matrox Intellicam User Guide for more information.

Modes 1 and 2

- **Camera configuration:** Camera configuration tool and drivers for this camera are available from the BASLER web site (http://www.baslerweb.com/).
- **Capturing color information:** Color information is generated (by this camera) using a Bayer color mosaic filter mounted on the sensor. RGB information can only be obtained through software-based conversion. **Important:** Following each frame capture it will be necessary to make a call to the BASLER library from your MIL/MIL-Lite program in order to reconstruct the proper color image.

Cabling Requirements

Mode 1: Pseudo-continuous

- DBHD100-TO-OPEN cable and GEN/DIG/BRD/L/_ board required for digital data, synchronization and control signals.
- Connections between the 44-pin connector of the camera and the 100-pin connector of the GEN-DIG-BRD/L/_ are as follows:

GEN-DIG-BRD/L/_ (100-pin connector)			**BASLER A101C (44-pin connector)**	
Pin name	***Pin no.***		***Pin name***	***Pin no.***
DATA, INPUT, 0+	01	←	DOUT0+	01
DATA, INPUT, 0-	02	←	DOUT0-	16
DATA, INPUT, 1+	03	←	DOUT1+	02
DATA, INPUT, 1-	04	←	DOUT1-	17
DATA, INPUT, 2+	05	←	DOUT2+	03
DATA, INPUT, 2-	06	←	DOUT2-	18
DATA, INPUT, 3+	07	←	DOUT3+	04
DATA, INPUT, 3-	08	←	DOUT3-	19

continued

Cabling Requirements (continued)

GEN-DIG-BRD/L/_ (100-pin connector)			BASLER A101C (44-pin connector)	
Pin name	***Pin no.***		***Pin name***	***Pin no.***
DATA, INPUT, 4+	09	←	DOUT4+	05
DATA, INPUT, 4-	10	←	DOUT4-	20
DATA, INPUT, 5+	11	←	DOUT5+	06
DATA, INPUT, 5-	12	←	DOUT5-	21
DATA, INPUT, 6+	13	←	DOUT6+	07
DATA, INPUT, 6-	14	←	DOUT6-	22
DATA, INPUT, 7+	15	←	DOUT7+	08
DATA, INPUT, 7-	16	←	DOUT7-	23
HSYNC, INPUT, +	33	←	LVAL+	33
HSYNC, INPUT, -	34	←	LVAL-	34
VSYNC, INPUT, +	35	←	FVAL+	39
VSYNC, INPUT, -	36	←	FVAL-	40
GROUND	37		GND	43
GROUND	38		GND	44
CLOCK, INPUT, +	39	←	PCLK+	35
CLOCK, INPUT, -	40	←	PCLK-	36
EXPOSURE1, OUTPUT, +	95*	→	EXSYNC+	37*
EXPOSURE1, OUTPUT, -	96*	→	EXSYNC-	38*

* These connections are not required for this mode, however allows this cable to be used with all modes.

Mode 2: Asynchronous Reset

- DBHD100-TO-OPEN and IMG-7W2-TO-5BNC cables, and GEN/DIG/BRD/L/_ board required for digital data, synchronization and control signals.
- External trigger source should be connected to the trigger input (GRAY BNC) of the IMG-7W2-TO-5BNC cable.
- All other connections are as in Mode 1: *Pseudo-continuous*

Modes 1-2

- Connections between the 2-pin subminiature round connector on the rear panel of the camera and the power supply are as follows:

Power Supply		BASLER A101C (2-pin connector)	
Pin name	***Pin no.***	***Pin name***	***Pin no.***
+24V	03	GND	01
+24V	04	GND	02

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Cabling Requirements (continued)

- Connections between the DB-9 connector on the rear panel of the camera and the system (RS-232 interface) are as follows:

Pin	Signal
2	RxD
3	TxD
5	GND
1, 4, 6, 7, 8, 9	NOT CONNECTED

The DCF(s) mentioned in this application note can be found on the MIL and Native Library CD, or our FTP site (ftp.matrox.com). The information furnished by Matrox Electronics System, Ltd. is believed to be accurate and reliable. Please verify all interface connections with camera documentation or manual. Contact your local sales representative or Matrox Sales office or Imaging Applications at 514-822-6061 for assistance.

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